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## Department of Toxic Substances Control

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Arnold Schwarzenegger  
Governor

December 11, 2006

Mr. Thomas L. Macchiarella, Code BPMOW.TLM  
Department of the Navy  
Base Realignment and Closure Program  
Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310

### REVIEW OF DRAFT WORK PLAN FOR SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING AT OPERABLE UNIT 2C, ALAMEDA POINT, ALAMEDA COUNTY

Dear Mr. Macchiarella:

The Department of Toxic Substances Control (DTSC) has reviewed the document cited above, prepared by Bechtel Environmental, Inc. (BEI) for the U.S. Department of the Navy, Naval Facilities Engineering Command, Southwest Division (Navy), and dated September 2006.

OU 2C consists of Installation Restoration (IR) Sites 5, 10, and 12. Previous investigations indicated the presence of chemicals of potential concern (COPCs) in soil and groundwater. However, further investigation is needed to address identified data gaps. This further investigation will require sampling of soil, soil gas and groundwater to complete the characterization of OU-2C, assess the direction of groundwater flow on the western margin of OU-2C and assess the potential human health risk and ecological risk.

The majority of OU-2C is occupied by buildings with the remaining portions occupied by paved areas and limited areas of open space. IR Site 5 consists primarily of Building 5, also known as the Aircraft Rework facility. Building 5 was closed in 1993. Past uses included:

- cleaning, reworking and manufacturing metal parts,
- plating, painting and tool maintenance operations, and
- special operations such as application of radio luminescent paint to aircraft dial faces.

Lead-acid and nickel-cadmium batteries were serviced in the battery storage area of IR Site 5.

Site 10 consists primarily of Building 400, with the remainder of the site consisting of paved parking lots, paved roads and open space. Past operations at Building 400 included:

- paint stripping,
- construction of fiberglass airplane components,
- airplane parts cleaning and degreasing,
- silk screening, photographic development, and
- radioluminescent painting of aircraft dial faces.

Currently, the building is used by a movie production company for office space and a production lot.

IR Site 12 consists of Building 10, as well as paved areas and urban open space. Building 10 operated as a power plant from the late 1930s to base closure in 1996. Chemicals stored in the building include:

- petroleum products,
- laboratory chemicals,
- plant treatment chemicals,
- microbiocide,
- morpholine, and
- corrosives.

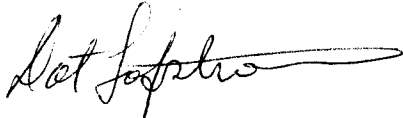
Typical urban wildlife, such as the California ground squirrel, scrub jays and American robins, in addition to feral cats, have been observed at IR Site 12.

Comments on the Draft OU 2C Work Plan are attached from Ms. Michelle Dalrymple of DTSC's Geological Support Unit (GSU) and Mr. Jim Polisini of DTSC'S Human and Ecological Risk Division (HERD). Please incorporate the recommended revisions and respond to the comments in the Draft Final OU 2C Work Plan.

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If you have any questions, please contact me at (916) 255-6449 or by e-mail at [dlofstro@dtsc.ca.gov](mailto:dlofstro@dtsc.ca.gov).

Sincerely,



Dot Lofstrom, P.G.  
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Attachment

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## ATTACHMENT

Comments From the Department of Toxic Substances Control Geological Services Unit (GSU) and Human and Ecological Risk Division (HERD) on the Draft Work Plan for Supplemental Remedial Investigation Sampling at Operable Unit 2C, Alameda Point, California

### GENERAL COMMENTS AND RECOMMENDATIONS FROM DTSC GSU

- A. The Draft Work Plan (DWP) provides extensive information regarding the proposed field effort. However, the DWP excludes some of the required work plan elements in accordance with Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (US EPA October 1988). The main body of the DWP lacks sufficient detail to meet the requirements set forth in the guidance, particularly in the scope of the proposed investigation and rationale. A general discussion of the rationale, approach, and scope of work should be included in the main body of the DWP to provide an understanding of the purpose of the investigation and the type of data to be collected to meet the objectives. RI/FS guidance states that, "The scope of the RI site characterization should be documented in the work plan, with detailed descriptions provided in the SAP." While this information is included in detail in the Sampling and Analysis Plan (SAP), the purpose of the SAP is to provide a detailed description of field methods, sampling procedures, analytical methods, and quality assurance/quality control requirements.

The DWP Section 1.2 - *Scope of Effort* provides a thumbnail sketch of the proposed investigation; however, the information in this section insufficiently addresses the required elements of the work plan. The scope of effort (RI tasks) should be presented in terms of the Conceptual Site Model (CSM), specifically:

- what is already known about the site
- the site history, and
- perceived data gaps.

Although a large number of samples and field activities are proposed, these are not tied to the specific evaluation areas, data gaps, or Solid Waste Management Units (SWMUs), or to the objectives of the proposed sampling. As a result, the reviewer does not understand how the proposed activities will satisfy the data needs.

### **Recommendation**

**A new section that briefly describes the rationale, approach, and scope of work proposed for the OU-2C supplemental RI sampling should be added to the main body of the DWP, following after Section 3. This section should be organized by study areas (evaluation area, data gaps, and SWMUs) and may cross-reference the SAP for greater detail, if necessary.**

- B. The SAP consists of the Field Sampling Plan and Quality Assurance Project Plan (QAPP). The SAP guides the investigation and field program and is used by the project team that executes the work. The SAP also facilitates regulatory oversight to ensure protection of human health and the environment. However, throughout the SAP, inconsistent or insufficient details are provided for field methods, procedures, and rationale. In addition, the data quality objectives (DQOs) for all six evaluation areas and other data gap areas are developed and presented on a single table, even though there are distinct differences among the various areas with respect to the media of concern, objectives, and limits of investigation. As a result, the decision rules are oversimplified. Because of the lack of rigorous detail provided in the SAP, particularly with respect to field procedures and decision rules, DTSC does not fully concur with the proposed activities.

### **Recommendation**

**A rigorous and systematic presentation of field sampling methods, procedures, and rationale should be provided in the SAP. In addition, due to the distinct differences and complexities of each evaluation area, DQOs within the table should be evaluated for each of the study areas, and modified as appropriate.**

- C. The DWP identifies 6 evaluation areas, 12 data gap areas, and 22 SWMUs as unique study areas at OU-2C. Appendix A1 – *Study Areas at OU-2C* describes each study area and provides area-specific problem statements and optimized sampling designs. The discussion in Appendix A1, however, describes only those SWMUs that are physically located within the boundaries of the evaluation areas. A separate section to discuss the SWMUs which are not physically located within the boundaries of an evaluation area is presented at the end of Appendix A1. The inclusion of SWMUs within evaluation area discussions produces a disjointed presentation and should be revised.

### **Recommendation**

**The discussion for each SWMU should be expanded within the individual evaluation area, to match the level of detail provided at the end of Appendix A1. Additionally, SWMUs described in each evaluation area should also be**

listed in Section A1.9 with a reference to the appropriate section earlier in the text.

- D. The terms "*screening criteria*", "*regulatory criteria*," "*comparison criteria*", "*Alameda Point screening criteria*", and "*Alameda Point background criteria*" are used in the document but are not defined. Although, the DQO tables include a listing of the types of screening criteria, the specific values are not provided. The referenced SAP and SAP Appendix A1 tables list various screening criteria for soil and groundwater but the specific proposed values for the supplemental RI are not identified. The specific values should be identified, particularly when there are multiple criteria listed for the same analyte. Also, proposed screening criteria for soil gas are not referenced in the DQO tables and are not listed on tables in the SAP.

#### **Recommendation**

**The terminology for screening criteria should be defined in the main body of the DWP and in the SAP. The screening criteria proposed for soil, soil gas, and groundwater should be identified and listed by analyte in tables in the main body of the DWP; alternatively the DWP could reference the appropriate tables in the SAP. DTSC suggests that a single table be provided for each medium of concern (soil, soil gas, and groundwater). The tables should list all potentially applicable screening criteria and should identify proposed values for the supplemental RI.**

- E. The DWP states that metals in soil are compared to Alameda Point background only if their concentrations are above preliminary remediation goals (PRGs). According to the DWP, a metal concentration is only considered an exceedence if it is greater than both the residential PRG and the background threshold concentration (95<sup>th</sup> percentile of the Alameda Point background data set). This type of comparative analysis for the work plan and supplemental RI is inappropriate. Comparisons to PRGs will not provide sufficient information to determine whether a site-specific release has occurred. Comparison to the background threshold value is required.

#### **Recommendation**

**All metals found in soil should be compared to the 95<sup>th</sup> percentile of the appropriate Alameda Point Background data set to determine whether or not a site-specific release has occurred and if so, whether the release has been adequately characterized.**

- F. The DQOs specify that chemicals will be compared to screening criteria to determine whether characterization of the nature and extent of contamination is complete. However, comparisons to screening criteria for soil (such as PRGs) is

not sufficient to determine whether potential impacts to groundwater have occurred and/or are ongoing. As a result, the need for additional groundwater sampling may be overlooked. If the analytical results for soil samples indicate that a release of volatile organic compounds (VOCs), metals, or other constituents has occurred that may have impacted or continue to impact groundwater, additional groundwater sampling may be required.

### **Recommendation**

**Contaminant concentrations in soil should be evaluated to determine whether groundwater impacts may have occurred and to assess the need for further groundwater sampling. A decision rule should be added to the DQOs that identifies the steps to be taken if a release is discovered in soil that indicates groundwater may be impacted. This is particularly important for areas that do not have historical groundwater data and are not proposed for groundwater sampling as part of the supplemental RI.**

- G. The DQOs (Table 1-6) state that the top of the Bay Sediment Unit (BSU) is approximately 35 feet below ground surface (bgs). However, lithologic logs from the draft RI report and cross-sections in the DWP indicate that the top of the BSU is roughly 15 feet bgs. The relationship between the artificial fill, BSU, and Merritt Sand has not been thoroughly evaluated in this work plan (see GSU Specific Comment 25). As such, the terms “upper” first water-bearing zone (FWBZ) and “lower” FWBZ should not be used in the DWP. While it is possible that the FWBZ contains horizons within it that may be further defined, the hydrostratigraphy at OU-2C has not yet been evaluated to the level that is required to define such zones.

### **Recommendation**

**The terminology in the DWP should be revised for the FWBZ intervals proposed for investigation. One approach might be to refer to the “upper” and “lower” FWBZ as target sampling depth-intervals, such as “shallow” and “deeper.” The hydrostratigraphy may be further refined during the data evaluation phase of the supplemental RI based on interpretation of the new data combined with existing data. If intervals within the FWBZ need to be further defined, recommendations for terminology can be made in the supplemental RI report.**

- H. Several errors and inconsistencies were noted throughout the portion of the document that was not italicized. Be advised that the italicized text information that was extracted from the draft RI report may also contain errors and inconsistencies, and should be reviewed.

## SPECIFIC GSU COMMENTS AND RECOMMENDATIONS

1. Section 1 – Introduction. A map should be added that identifies evaluation areas, data gaps, SWMUs and other study areas. Also, soil gas should be added as a media of concern for Evaluation Area 1 in this section and elsewhere in the DWP.
2. Section 1.1 – Project Purpose. State that an additional project purpose is to evaluate the tidal influence between Seaplane Lagoon (located south of OU-2C) and OU-2C

Section 1.2 – Scope of Effort. Add a new section to the main body of the DWP that provides a general description of the rationale, approach, and scope of work for each study area (see General Comment A). For example, the text states that up to eight piezometers will be installed for aquifer testing but does not clarify why aquifer testing is needed. The purpose of the aquifer testing will determine what type of aquifer testing should be performed (i.e., slug test, step-drawdown test, constant-rate pump test). Without an understanding of the basis and rationale for the scope of work and general description of sampling locations (i.e., study areas), the usefulness of the information provided in this section is limited.

3. Section 2.5 – Conceptual Site Model. The lithologies provided on the Conceptual Site Model (CSM) for OU-2C should be verified and corrected, as appropriate. For example, the “Bay Sediments” are listed as “silty clay” on the CSM for IR Site 5. Although the BSU is consistently encountered beneath OU-2C as indicated by a color change in the soil, the lithology of this unit has been demonstrated to be variable. According to the lithologic logs provided in the draft RI Report (SulTech 2005) and on the cross sections in the DWP, bay sediments can include layers of sand, silty sand, sandy silt, silt, clayey sand, clayey silt, and silty clay. Also, the solvent groundwater plume (including free phase and dissolved phase solvents) at IR Site 5 has migrated to depths within the BSU, and possibly deeper, but this is not illustrated on the CSM. Thus, the CSM should be revised to correctly reflect lithology and the extent of the solvent groundwater plume.
4. Section 2.5.1 – Potential Soil Contamination. The following comments pertain to this section:
  - Define the following terms used in this section and elsewhere in the DWP: *Alameda Point screening criteria*, *screening criteria*, and *Alameda Point background levels* (see General Comment D).
  - The statement, “ little or no contamination of soil at OU-2C has been found during previous investigations...” is misleading. Previous investigations have confirmed soil contamination by VOCs, metals, and cyanide beneath Building 5, and a soil removal action for cadmium was required. The Navy should



revise this statement to reflect the presence of soil contaminants detected beneath Building 5.

- For the bulleted discussion on page 2-26, the general study areas (such as evaluation areas, data gaps, and SWMUs) should be listed within each bulleted item. If a map is provided, as suggested in Specific Comment 1, it should contain the features that are called out in this discussion, such as industrial wastewater sewer lines, foundry, Aircraft Maintenance Line, battery acid shop, etc.
- The battery acid shop doesn't seem to belong in the category "Aircraft Maintenance Line."
- The phrase "and groundwater" should be removed from the third item listed under the third bullet on page 2-26.

5. Section 2.5.2 – Groundwater Contamination. The following comments pertain to this section:

- The locations of roadways discussed in this section should be depicted on a map, since the extent of groundwater contamination is discussed by using the roadways as landmarks.
- The first paragraph states that "Few, if any, chemicals have been reported at concentrations above screening criteria in groundwater at IR Site 5 east of Lexington Avenue, at IR Site 10 south of West Tower Avenue, and at IR Site 12." The phrase, "few, if any" is ambiguous and imparts little, if any, information. The Navy should clearly state if chemicals have been reported above screening criteria in groundwater samples from these areas, and what screening criteria were used for this evaluation.
- The DWP states that "arsenic is naturally occurring and its presence is attributed to background conditions at OU-2C." The Navy should discuss the other nine metals detected in groundwater at concentrations exceeding screening criteria, indicate which are attributed to background, and state what screening criteria were used for this evaluation.
- A map should be provided that shows the boundaries of the four dense non-aqueous phase liquid (DNAPL) plumes (Plumes 5-1 through 5-4) discussed on page 2-28.
- We are unaware of the presence of a former solvent tank located in the vicinity of Plume 5-1 and well M05-07. Where did the Navy find this information and where is the tank located? The source of Plume 5-1 may be the storm sewer lines that pass through this area.
- The last bullet of this section discusses soil gas, not groundwater. A separate section should be added to discuss the potential for soil gas contamination and migration to indoor air, as well as previous soil gas results from OU-2C.

## **Attachment A, Sampling and Analysis Plan (SAP)**

6. Attachment A, SAP Section 1.2 – Problem Definition/Background. Clarify why Evaluation Area 4 is specified as the *Aircraft Maintenance Line* rather than the *northern portion of Building 5* as identified elsewhere in the DWP.
7. Attachment A, SAP Section 1.2.1 – Purpose and Objectives. As stated elsewhere in the DWP, another purpose is to evaluate the tidal influence between the Seaplane Lagoon and OU-2C .
8. Attachment A, SAP Section 1.2.3 – OU-2C Description. The discussion in this section identifies specific building numbers, street names, and other features that are not shown on the referenced figure (Figure 1-2). A figure should be added to illustrate the identified features.
9. Attachment A, SAP Section 1.3 – Project/Task Description. The following comments pertain to this section:
  - All wells, not just the newly installed wells, should be sampled for the full suite of VOCs and metals during the supplemental RI so that the data interpretations presented on maps in the supplemental RI report represent a single sampling event.
  - The specific geotechnical analyses that will be performed on soil samples should be clearly stated; the report should also indicate how the results will be used.
  - The fourth bullet (Aquifer testing) states that aquifer testing will be performed at all new and existing monitoring wells. What type of aquifer testing is proposed? What will the Navy do with the results of the aquifer test? Please confirm that the Navy's intent is to conduct aquifer tests at all wells, including existing wells and new wells. The answers to these questions should be included in the draft final Workplan text, not just in "response to comments."
  - The fifth bullet (Data evaluation) should include a statement that data from the investigation will also be used to evaluate hydraulic characteristics of the aquifer from the results of the aquifer testing.
10. Attachment A, SAP Section 1.4 – Quality Objectives and Criteria. Table 1-6 does not include DQOs for subslab soil gas sampling. Subslab soil gas sampling DQOs should be added to the table. Step 4 of the DQOs on Table 1-6 states that the lateral boundaries for the supplemental RI and data gap areas will include groundwater within OU-2C as defined by Evaluation Area 1. However, these limits do not encompass groundwater at Evaluation Area 2, which should also be included.

Previously, DTSC suggested in informal e-mail correspondence with the Navy that DQO tables be provided for each of the evaluation areas separately because the problem statements, media of concern, study boundaries, and possibly decision rules are different for most areas. While DTSC has withdrawn that request, due to the overly large tables that would be generated, we urge the Navy to take care to assess each evaluation area carefully and ensure that the information for each area is area-specific.

11. Attachment A, SAP Section 2.1.1 - Hollow-Stem-Auger Drilling. The following comments pertain to information presented in this section:
  - It is unclear whether lithologic logging will be performed in accordance with Standard Operating Procedure (SOP) 3, *Borehole Logging*, as specified for direct-push drilling in the following section (2.1.2).
  - This section does not state whether soil samples collected from hollow-stem auger borings will be submitted for geotechnical analysis. Also, soil sample collection and handling methods are not included, nor are the appropriate section(s) of the SAP referenced, which provides this information. Finally, this section should state whether soil samples will be collected for chemical analyses from hollow-stem-auger borings.
  - The Navy should clarify on page A2-2 that only boreholes that are not completed as monitoring wells will be backfilled. Also, the SAP should clearly state that the borehole abandonment requirements of the Alameda County Public Agency will be followed, in addition to Department of Water Resources Bulletin 74-90 and SOP-13.
12. Attachment A, SAP Section 2.1.2 - Direct-Push Drilling. Does SOP 13, *Destruction of Boreholes and Wells*, also apply to the destruction of direct-push boreholes? This should be clearly stated in this section.

Also, according to the information in Table 1-3, many of the direct push boreholes will be drilled to a depth of 30 feet bgs. The Navy should clarify in the last bullet of this section that the expected sampling depth is generally up to 30 feet bgs, not 20 feet bgs as stated.
13. Attachment A, SAP Section 2.1.3 - Piezometer Installation. The Navy should provide additional details regarding piezometer installation including construction methods, construction details, and construction materials. Include the rationale for proposed construction details (i.e., depths, screen intervals, screen lengths).
14. Attachment A, SAP Section 2.1.4 - Aquifer Testing. The text indicates that slug tests are proposed for all newly constructed wells and previously existing monitoring wells. Please verify that this is the Navy's intent. Also, the purpose of the aquifer testing should be clearly stated to ensure that the selected method

will meet the objectives. The Navy should also provide a reference to subsequent SAP Section 2.2.4 for detailed information on aquifer testing procedures and methods of analysis.

15. Attachment A, SAP Section 2.1.5 – Subslab Soil Gas Sampling. The following comments pertain to this section:

- The SAP should clearly state that Building 5 is currently vacant and that the potential risk evaluation is for hypothetical future building occupants.
- The Navy should provide a reference to subsequent SAP Section 2.2.3 for detailed information on subslab soil gas sampling procedures and to Appendix E for the risk assessment work plan.
- The SAP states that risk assessment results, interpretations, and conclusions will be presented in a technical memorandum. Is this technical memorandum in addition to the Supplemental RI Report outlined in Figure 1.3 of the main body of the DWP?

16. Attachment A, SAP Section 2.1.6 – Monitoring Well Construction. The following comments pertain to this section:

- List the specific geotechnical analyses for soil samples and the purpose of the analyses, or cross-reference a section which provides this information.
- Provide the rationale for screen placement in wells that are not planned to intersect the water table.
- Figure 2-1 does not show the 0.5-foot blank casing to be used as a sump. Please add this feature to the diagram.
- Adjust the proposed well design to account for shallow water table conditions at OU-2C to include appropriate annular sealing materials used for well construction. If a well is screened 2 feet above the water table, and the filter pack extends two feet above the top of the screen, the well materials are within a foot of the ground surface. Design specifications for water-table wells and deeper wells should be discussed separately.
- Specify that well vaults will be raised slightly above grade to allow surface water to drain away from the well.
- Expand the well development procedures description to provide greater detail on the proposed methods, equipment to be used, and water quality parameter monitoring. Development should proceed until water quality parameters have stabilized and at least 5 well volumes (including water within the casing and filter pack) have been removed. The applicable SOP that will be followed for well development should be referenced.

17. Attachment A, SAP Section 2.1.9 – Groundwater Monitoring Well Sampling. The last sentence of the first full paragraph of this section is unclear and should be revised.
18. Attachment A, SAP Section 2.2.1 – Soil Sampling Procedures. Item number 2 states that soil samples will be collected with a disposable scoop. This is an inappropriate method for “undisturbed” samples that are required to be collected in stainless steel, brass, or acetate sleeves (per QAPP Worksheet 19-soil). The Navy should provide the sampling procedures for soil samples collected in stainless steel, brass, or acetate sleeves to be submitted for geotechnical and chemical analyses.
19. Attachment A, SAP Section 2.2.2 – Groundwater Sampling Procedures. The following comments pertain to this section:
- Specify the estimated depth of sampling for each well by specifying the pump placement within the screened interval. The basis for the proposed sampling depth should be provided. Also, specify the procedures for lowering the sampling equipment into the wells and how agitation of the water column will be minimized.
  - State that pump discharge rate will be lowered, as necessary, to minimize drawdown during purging and allow water levels to stabilize prior to sampling in accordance with the requirements for low-flow sampling.
  - Specify that field water-quality parameter measurements will begin after one tubing volume (including the pump and flow-through cell volumes) has been purged.
  - Clarify that water levels will be measured and recorded at frequent intervals during purging, and that sampling will proceed after both water level drawdown and field parameters have stabilized. Stabilization of water levels prior to sampling is a key component of low-flow sampling.
  - Item 10 states that sampling is planned for unfiltered metals analysis. However, in Section 2.1.8 on page A2-6, it is stated that groundwater samples for metals analysis will be filtered in the field. This contradiction should be reconciled.
  - State that samples collected for VOC analyses will be checked to ensure that they do not contain air bubbles.
  - Specify that total well depth measurements will be taken after sample collection to minimize disturbance of the water column prior to sampling.
  - Clarify the sampling method that is proposed for wells or sample locations that are purged to dryness and/or for which drawdown cannot be stabilized, even using low-flow methods.

- The Ground Water Forum Issue Paper: *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers* (Yeskis, D. and B. Zavala, 2002) is a useful reference for groundwater sampling procedures in the DWP.
20. Attachment A, SAP Section 2.2.5 – Equipment Decontamination.  
Decontamination procedures should be described for large down-hole equipment such as hollow-stem augers, direct-push drilling rods, surge blocks, and well development bailers.
21. Attachment A, SAP Section 2.4 – Analytical Methods. Why does Table 2-2 list only soil PRGs and California Toxics Rule (CTR) values as regulatory criteria and not maximum contaminant levels (MCLs), Alameda Point background values, and other potentially applicable criteria (see General Comment D)? Also, a table listing method reporting limits and screening criteria for soil gas samples should be included in this section, similar to Table 2-2.

#### **Appendix A1 to the SAP – Study Areas at OU-2C**

22. Appendix A1 to the SAP – Foreword. In the subsection entitled *Source Documents*, it is stated that data from the referenced investigations in this section are presented on the compact disk in Appendix A2 to the SAP. However, it appears that Appendix A2 only includes the data tables from Appendix C of the draft RI report (SulTech 2005). The Navy should clarify whether these tables include all of the data available for OU-2C from the referenced sources, such as data from the Basewide Groundwater Monitoring Program (BGMP) and DNAPL removal actions, or if separate data tables should be provided.
23. Appendix A1 to the SAP – Foreword. The following comments pertain to the subsection entitled *Screening Criteria* and to the subsequent tables:
- The screening criteria tables do not specifically identify which value is used when there are multiple screening values provided for a given analyte. The specific screening value that was used should be identified in these tables.
  - Tables A1-4 through A1-17, which presents the compounds of potential concern exceeding screening criteria, should specify which screening value was used when there are multiple values, that is, Federal MCL or California MCL, residential PRG or industrial PRG.
  - The federal MCL for cyanide on Tables A1-1 and A1-11 is incorrectly listed as 150 micrograms per liter (µg/l). The federal MCL for cyanide is 200 µg/l. The California MCL of 150 µg/l should be used on Table A1-11 because it is the lower of the two values.
  - Why are CTR criteria not included in Tables A1-4 through A1-17?

- It is stated that metals in soil are compared to Alameda Point background if their concentrations are above PRGs. DTSC disagrees with this type of comparative analysis for this work plan and for the supplemental RI. Comparisons to PRGs will not provide sufficient information to determine whether a site-specific release has occurred. Comparison to the background threshold value is required. A metal concentration is only considered in exceedence if it is greater than both the residential PRG and the background threshold concentration (95<sup>th</sup> percentile of the Alameda Point background data set). This approach will not determine whether or not a site-specific release has occurred and if so, whether the release has been adequately characterized.

24. Appendix A1 to the SAP – Foreword. The SAP states that, depending on the field conditions, soil samples may be collected using hand-auger equipment, but does not specify a method for collecting soil samples for chemical or geotechnical analyses in hand-auger borings.

The method for soil sample collection from hand-auger borings should be specified in an appropriate section in the SAP. It should be clarified how samples collected using hand-auger equipment will meet the requirements of QAPP Worksheet 19-soil. The SAP should also specify the field conditions that would require soil samples to be collected using hand-auger equipment.

25. Appendix A1 to the SAP, Section A1.1 – Evaluation Area 1. The following comments pertain to this section:

- The SAP states that Evaluation Area 1 consists of groundwater beneath OU 2C that has been impacted by chlorinated VOCs. However, other contaminants such as 1,4-dioxane, cyanide, and metals that may potentially impact groundwater are also included in Evaluation Area 1, which should be acknowledged by the SAP. In addition, it should be clarified that soil gas beneath Building 5 is being evaluated as part of Evaluation Area 1.
- Page A1-3 of the SAP states that the upper FWBZ extends from 5 to 15 or 17 feet bgs, and that the lower FWBZ extends from 17 to 35 or 40 feet bgs. However, Figure A1-3 illustrates the upper FWBZ from 5 to 18 feet bgs and Figure A1-4 illustrates the lower FWBZ from 20 to 40 feet bgs. Depth intervals between figures and text should be consistent.
- The description of the hydrostratigraphy beneath OU-2C is not supported with sufficient analysis and interpretation. The basis for the determination of an “upper” and “lower” FWBZ is not thoroughly presented and evaluated (such as through the use of cross-sections and/or fence diagrams). Also, the terminology is not consistent with that described in Section 2.3.3.1 of the main body of the DWP (see first full paragraph on page 2-18). It is unclear whether the BSU at OU-2C is considered to be acting as an aquitard between the

FWBZ and SWBZ, or if it is considered to be part of the FWBZ, or both. The Navy should provide site-specific cross-sections and analyses that support the description of the hydrostratigraphy at OU-2C, or remove the terminology which specifies an “upper” and “lower” FWBZ until additional data can be obtained and evaluated (see General Comment G). We suggest that the “upper” and “lower” FWBZ are referred to as target sampling depth-intervals, such as “shallow” and “deeper” intervals for the purposes of the DWP.

- A map showing SWBZ sample locations and chlorinated hydrocarbon detections should be included, similar to Figures A1-3 and A1-4.
- The analytical results for groundwater samples collected at Evaluation Area 2 should be shown on Figure A1-3 for a more complete representation of the historical groundwater data for OU-2C. This figure can be referenced in the discussion of Evaluation Area 2 (Section A1.2.2.1).
- The Navy should indicate whether FWBZ monitoring well 2MW8S is currently sampled as part of the BGMP or whether this well has been decommissioned as a result of the DNAPL removal action at Plume 5-3.

26. Section A1.1.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:

- The boundaries of all four DNAPL plumes (including Plumes 5-2 and 5-4) should be shown on a map.
- DTSC is unaware of the presence of a former solvent tank located in the vicinity of Plume 5-1 and well M05-07. The Navy should cite the source of this information and the size and location of the tank. Also, the Navy should acknowledge that the source of Plume 5-1 may be the storm sewer lines that pass through this area.
- The SAP states that the source of solvent Plumes 5-2 and 5-4 may be the former foundry and heat treatment area. If these areas are the source of plumes 5-2 and 5-4, significant VOC contamination may be present beneath these areas. The supplemental RI investigation should be designed to evaluate whether the source of Plumes 5-2 and 5-4 may be the former foundry and heat treatment area. Soil and groundwater samples should be collected from these areas.
- The SAP states that additional groundwater sampling for VOCs in the two areas that have been targeted for removal actions (Plumes 5-1 and 5-3) is not proposed as part of the supplemental RI field activities. Rebound effects in excess of remediation goals (yet to be established) may occur as a result of back-diffusion from the underlying low-permeability soils. Hence, continued groundwater monitoring should be performed inside and outside of the DNAPL plume boundaries. The Navy should clarify whether sampling for rebound effects is being conducted and the duration and locations of rebound



sampling, or provide a reference to the appropriate source for this information.

- The SAP states that “arsenic is naturally occurring and its presence is attributed to background conditions at OU-2C.” The Navy should clarify which, if any, of the other nine metals detected in groundwater at concentrations exceeding screening criteria are attributed to background, and
- Clarify what screening criteria were used for this comparison (i.e., Alameda Point background or MCLs).
- This section discusses groundwater flow patterns at OU-2C. However, there are no groundwater elevation maps provided in the DWP to support the interpretations. Groundwater elevation maps that have been used to develop the scope of this investigation should be provided in the DWP.

27. Appendix A1 to the SAP, Section A1.1.3.1 – Aquifer Testing. This discussion should be expanded so that the procedures for aquifer testing and purpose of each task is spelled out more clearly, as follows:

- The details of the proposed tidal influence study should be clearly stated, and specific OU-2C specific wells which will be used should be identified.
- Will water levels be measured at low tide during the supplemental RI, or will data from the BGMP from Spring 2006 be used?
- Clarify what decisions will be used as the basis for determining whether piezometers pairs and/or lower FWBZ piezometers will be needed.
- Describe the purpose of the slug tests and how the data from the slug tests will be used.
- State the reason why slug tests were chosen over other aquifer test methods and provide information on which wells will be selected for testing.

28. Appendix A1 to the SAP, Section A1.1.3.2 – Monitoring Well Installation. Identify the proposed location of well M05-19 on Figure A1-2. Also, DTSC recommends that the discussion of proposed monitoring wells for Evaluation Area 2 be moved to Section A1.2 - *Evaluation Area 2*. While Table 1-2 of the SAP identifies the proposed depths and locations of geotechnical soil samples, the rationale are not provided on this table. The Navy should also include the purpose of the proposed geotechnical samples.

29. Appendix A1 to the SAP, Section A1.1.3.3 – Monitoring Well Sampling. A full round of samples should be collected from new and previously existing monitoring wells during the supplemental RI and analyzed for the full-suite of VOCs, metals, and 1,4-dioxane so that data interpretations presented in the RI report represent a single sampling event.

30. Appendix A1 to the SAP, Section A1.1.3.4 – Subslab Soil Gas Sampling. The SAP should clearly state that the building is currently vacant and the risk is being evaluated for hypothetical future building occupants.
31. Appendix A1 to the SAP, Section A1.2.3 – Proposed Sampling Rationale and Design. The objectives for Evaluation Area 2 should include a provision to assess the vertical extent of groundwater contamination if shallow groundwater is found to contain elevated levels of VOCs.
32. Appendix A1 to the SAP, Section A1.3 – Evaluation Area 3. Section A1.1.3 states that the former foundry and heat treatment areas may be the source of solvent plumes 5-2 and 5-4. Therefore, it is unclear why data gap sampling only specifies “a possible release of metals” in this area.
33. Appendix A1 to the SAP, Section A1.3.1 – Historical Use. This section should include a discussion of the areas within Evaluation Area 3 that are proposed for further investigation such as the foundry, heat treatment area, rubber room, and the industrial wastewater lines.
34. Appendix A1 to the SAP, Section A1.3.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:
- If the analytical results for soil samples indicate that a release of VOCs, metals, or other constituents has occurred that may have impacted groundwater, groundwater sampling may be warranted. The Navy should devise a decision rule in the DQOs that will be followed if soil contaminant impacts indicate strong potential for a release to groundwater. This comment pertains to the following sections as well.
    - A1.4.3
    - A1.5.3
    - A1.6.3
    - A1.7.3.3
    - A1.7.4.3
    - A1.7.5.3
    - A1.8.3
  - The Navy will need to identify the locations and depths of samples from previous investigations with elevated metals (lead, iron, thallium and vanadium) as well as the range of concentrations before DTSC can concur with the proposed sampling approach in the foundry and heat treatment shop.

- The SAP states that the source of solvent Plumes 5-2 and 5-4 may be the former foundry and heat treatment area. If these areas are the source of Plumes 5-2 and 5-4, significant VOC contamination may be present beneath these areas. The supplemental RI investigation should be designed to evaluate whether the source of Plumes 5-2 and 5-4 may be the former foundry and heat treatment area. Groundwater samples, in addition to soil samples, should be collected from these areas and analyzed for the same suite of constituents identified for soil samples.
  - Due to the possibility that solvents were transported within the industrial sewer lines, soil samples EA3SB28 through EA3SB35 should also be analyzed for VOCs. Additional samples should be collected at a similar spacing along the segment of the industrial wastewater line that originates near the cyanide and chrome surge tanks and analyzed for the same suite of constituents (metals, hexavalent chromium, cyanide, and VOCs).
  - During preliminary discussions on the scope of the supplemental RI between the Navy and the regulatory agencies (June 15, 2006 teleconference), the Navy indicated that groundwater samples would be collected along the industrial wastewater drain lines. The groundwater samples should be analyzed for metals, hexavalent chromium, cyanide, and VOCs.
  - The SAP should indicate the purpose of the geotechnical analyses that will be conducted on the soil sample collected at location EA3SB12. Specifically, what geotechnical analyses will be performed?
  - As stated on page A1-41, borings EA3SB36 through EA3SB39 will be located adjacent to and on the assumed downgradient side of each feature. These borings should also be located as close to the feature of interest as possible, or at an obvious low point or crack/joint.
  - The Navy should indicate how the data gap regarding "confirmation of removal of soil with elevated concentrations of chromium and lead at the limits of the cadmium excavation area" will be addressed.
35. Appendix A1 to the SAP, Section A1.4.1 – Historical Use. This section should include a discussion of the areas within Evaluation Area 4 that are proposed for further investigation, such as the battery acid shop and paint mixing areas.
36. Appendix A1 to the SAP, Section A1.4.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:
- DTSC cannot concur with the sampling approach in the Aircraft Maintenance Line area without further information on the previous data from this area. The Navy should identify the locations and depths of the previous samples with elevated metals and provide the range of concentrations.

- A closer spacing of samples should be used to evaluate locations where elevated metals were previously found in soil in Evaluation Area 4. For those locations, at least three samples should be collected at a spacing of approximately 25 feet from the original sample and analyzed for metals. The SAP should indicate the purpose of the geotechnical analyses that will be conducted on the soil sample collected at location SM05B02 Specifically, what geotechnical analyses will be performed?
37. Appendix A1 to the SAP, Section A1.5 – Evaluation Area 5. This section should indicate that Building 415 is addressed in Section 1.7 which discusses buildings at IR Site 5 that have been identified as data gaps.
38. Appendix A1 to the SAP, Section A1.5.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:
- The Navy should include the locations and depths of the previous data that contained elevated chromium and lead and the range of concentrations.
  - The Navy should include a decision rule that will be applied if the groundwater sample collected from EA5SB17 exceeds screening criteria.
  - Due to the possibility that solvents were transported within these industrial sewer lines, soil samples EA5SB18 through EA5SB19 should also be analyzed for VOCs. Groundwater samples should also be collected from these locations and analyzed for metals, hexavalent chromium, cyanide, and VOCs.
  - A soil sample should be proposed within the 100-foot grid that is roughly centered on Building 615 in Evaluation Area 5. The Navy should add a sample location within this grid.
  - Due to the storage of chromium and cyanide in Building 261, this building was identified as a data gap. Samples should be collected from the vicinity of Building 261 and analyzed for hexavalent chromium and cyanide in addition to VOCs. (This data gap should be discussed in Section 1.7 for consistency.)
  - Analyses for polychlorinated biphenyls (PCBs) were not performed on previous samples collected from the hazardous waste storage area and this was identified as a data gap. Thus, soil samples should be collected from the hazardous waste storage area and analyzed for PCBs. The single sampling location proposed for Building 415 may not be sufficient.
  - The SAP should indicate the purpose of the geotechnical analyses that will be conducted on the soil sample collected at location EA5SB14 Specifically, what geotechnical analyses will be performed?
39. Appendix A1 to the SAP, Section A1.6 – Evaluation Area 6. This section should indicate that Buildings 34 and 500 are addressed in Section 1.7 which discusses buildings at IR Site 5 that have been identified as data gaps.

40. Appendix A1 to the SAP, Section A1.6.1 – Historical Use. DTSC questions the possible location of a former solvent tank shown on Figure A-10 in the northern portion of Area 6. The Navy should state the source of this information, and the location and size of the tank. Also, the locations of underground storage tanks (USTs) 5-2 and 5-3 are not shown on Figure A1-10. These features should be identified.
41. Appendix A1 to the SAP, Section A1.6.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:
- A data gap pertaining to UST 5-3 was identified because the former waste oil tank location was not previously sampled for PCBs, lead, or VOCs. Soil samples should be collected within the footprint of former UST 5-3 and analyzed for VOCs, TPH, metals, and PCBs.
  - The sampling location shown on Figure A1-10 to address AST 005G (location SAST5SB01) should be moved so that it is located as close as possible to, and on the downgradient side of, the former AST.
42. Appendix A1 to the SAP, Section A1.7.1.3 – Proposed Sampling Rationale and Design. The basis for the proposed locations of soil samples to be collected beneath Building 6 (DG006SB01 through DG006SB03) should be provided. Are these samples located adjacent to features that may have had a chemical release?
43. Appendix A1 to the SAP, Section A1.7.3.3 – Proposed Sampling Rationale and Design. The following comments pertain to this section:
- This section discusses collecting soil and discrete groundwater samples, but Figure A1-12 shows only soil sampling locations at these data gap areas. Are groundwater samples proposed for this area? If so, these should be included on Figure A1-12.
  - The SAP should indicate the purpose of the geotechnical analyses that will be conducted on the soil sample collected at location DG102SB01. Specifically, what geotechnical analyses will be performed?

## **COMMENTS FROM DTSC HERD**

### **SPECIFIC COMMENTS**

1. DTSC agrees that in those cases where there are fewer than 10 samples (Section 2.2.2, page E2-2) the maximum concentration may be used as the Exposure Point Concentration (EPC). In cases where there are more than 10 samples, calculation of the EPC should use the most current available version of the

U.S. EPA ProUCL software rather than version 2.3 (Section 2.2.2, page E2-2). The most current release version, as of October 25, 2006, is 3.00.02 (<http://www.epa.gov/esd/tsc/software.htm>).

2. There is no mention of any process in the Human Health Risk Assessment (HHRA) methodology (Section 2, pages E2-1 through E2-5) to reduce the number of Contaminants of Potential Concern (COPCs). Health protective media concentrations (e.g., EPA Region 9 Preliminary Remediation Goals [PRGs]), meant to screen sites, should not be used as a 'bright line' criterion to reduce the number of COPCs.
3. Arsenic in groundwater is attributed to 'background' at OU-2C (Section 2.5.2, page 2-27). Detected and estimated (J-qualified) arsenic 'ambient' groundwater concentrations range from 1.4 µg/L to 40.7 µg/L (n=107; File Name *BCK\_GW\_METALS\_111202.xls*). Three of 31 (9.67%) groundwater arsenic detects are in excess of 40.7 µg/L (85.8 µg/L, 79 µg/L, and 64.6 µg/L) (Table A1-10). Once the additional OU-2C groundwater samples are collected and analyzed, a statistical test should be performed to determine whether OU-2C groundwater arsenic concentrations are, in fact, 'ambient' concentrations. The statistical test chosen should focus on whether the extremes of the two groups differ (e.g., a quantile test) as opposed to focusing on whether the central tendencies differ. Arsenic in groundwater must be included in the estimate of cancer risk and/or hazard for total concentration in the HHRA.
4. Analysis for 1, 4-dioxane, "a common additive to chlorinated degreasing solvents," has not been conducted (Section 2.5.2, page 2-29) and should be incorporated into the suite of analytes of this OU-2C sampling and analysis event.
5. Groundwater, soil vapor and soil samples should all be analyzed for naphthalene, currently classified as a carcinogen by the Office of Environmental Health Hazard Assessment (OEHHA). Although U.S. EPA Method TO-15 recoveries of naphthalene may be variable (Hayes, et al., 2005), naphthalene can apparently be accurately measured by EPA method TO-15 being used in this investigation as long as correct naphthalene standards with appropriate moisture content are used.

#### **SPECIFIC COMMENTS ATTACHMENT A – RISK ASSESSMENT WORK PLAN**

6. The proposed homegrown produce exposure period of 20 percent of the residential use year (i.e., 70 days per year) (Section 2.2.3, page E2-3) is a reasonable approximation for the probable central tendency exposure period. HERD discussed this exposure route with Dr. Sophia Serda, U.S. EPA Region 9, on October 30, 2006 and U.S. EPA also agrees this value is representative.
7. The Federal Guidance Report No. 13 (2001) is proposed as the source for radioisotope cancer slope factors (Section 2.3, page E2-4). Regardless of source,

the cancer slope factors should agree with the most recent values available from the U.S. EPA (<http://www.epa.gov/superfund/resources/radiation/radrisk.htm#prg>) for health assessment of Superfund sites. DTSC defers to the California Department of Health Services should discrete sources be identified or in the event of differing advice on radioisotope cancer slope factors.

8. Total risk estimates for OU-2C sites determined to be contaminated with radioisotopes (Section 2.3, page E2-4) must be presented as the sum of the incremental risk associated with both chemical exposure and radiological exposure (OSWER, 1997).
9. DTSC agrees that evaluation of the inhalation pathway may not be required for the representative vertebrate receptors included in the OU 2-C ERA. Please clearly explain, in the text, why this exposure pathway is considered 'not applicable' (Section 3.2.6, page E3-7).
10. The San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Level (ESL) for mercury in marine waters ( $2.5 \text{ E-02 } \mu\text{g/L}$ ) should be used in the screening level ERA for aquatic receptors, rather than the proposed  $0.94 \mu\text{g/L}$  concentration (Section 3.3.1, page E3-8).
11. The hierarchy of aquatic toxicity values should be modified so that the 'available data from the scientific literature' (current fourth bulleted group) is the third preferred source over the 'Gold Book' values (current third bulleted group) (Section 3.3.1, page E3-8). Twenty years of aquatic testing and research have been published subsequent to the publication of the 'Gold Book.'
12. Recent re-evaluation (Birak, et al., 2001 and U.S. EPA 2005) of the Travis and Arms (1988) soil-to-plant Bioaccumulation Factors (BAFs) should be incorporated into applicable estimation equations for the ERA. The link to the U.S. EPA (2005) changes for plant uptake can be found in the Update Sheet at <http://www.epa.gov/ecotox/ecossl/>.
13. HERD agrees that selection of a median value BAF is appropriate when multiple BAF estimates are available (Section 3.4, page E3-10) as long as the BAF measurements or estimations are of equal rigor. However, please provide a more detailed explanation and justification for the selection of the single chemical or group-specific BAF where multiple BAFs are available. This could most easily be accomplished with a multiple-column table listing the available BAFs for each source in columns and the COPECs in rows with the value selected highlighted or shaded in some manner.
14. The Exposure Path diagram (Figure 1-1) indicates, in note b, that groundwater exposure will only be considered a complete pathway if there is evidence that groundwater is discharging to San Francisco Bay, Seaplane Lagoon or Oakland

Inner Harbor. As this work plan outlines supplemental characterization, please indicate in footnote b whether this determination has been already made based on existing data or will be made subsequent to the supplemental sampling. The significant detail provided for aquatic toxicity evaluation in the DWP would indicate that the determination has been made that groundwater discharges to San Francisco Bay surface waters.

15. The screening-level risk assessment process is described as medium-by-medium (Figure 3-1). In a medium-by-medium evaluation the figure should be amended so that the action after the first decision point of 'Complete exposure pathway present' for a 'no' response is 'Delete preliminary COC from further consideration for medium under evaluation.'
16. Use of the minimum body weight (BW) with an allometrically-calculated ingestion rate (IR) for the SLERA (Table 3-1) is incorrect. The complete direction by U.S. EPA (1997, Section 2.2.1) for a SLERA is to use minimum BW paired with maximum intake rates (<http://www.epa.gov/oswer/riskassessment/ecorisk/ecorisk.htm>). In later detailed presentation of the intake calculation (Table 3-7) the maximum body weight appears to have been used in the allometric intake equations for subsequent use with the minimum BW. Please correct the earlier SLERA column entry (Table 3-1) to indicate the IR is based on maximum BW allometric calculation.
17. This work plan proposes to evaluate herbivorous and insectivorous diets in both the SLERA and Step 3 refined SLERA (Table 3-3). However, different dietary regimes are proposed for the same representative species in the SLERA versus the Step 3A refined SLERA. Please provide some rationale for estimating ecological hazard for the same representative species as an herbivore in the SLERA but as an invertivore (e.g., song sparrow) in the Step 3A refined SLERA (Table 3-3). At the same time a different representative species is evaluated as an invertivore in the SLERA but as an herbivore (e.g., American robin) in the Step 3A refined SLERA.
18. A subset of the aquatic toxicity values (Table 3-4) was checked and all aquatic toxicity values checked are acceptable. However, the recent (i.e., since 1986) scientific literature should be checked for more protective concentrations for the mono-substituted benzene compounds and Polycyclic Aromatic Hydrocarbons (PAHs) where the 'Gold Book' is cited as the source.

### **DTSC HERD CONCLUSIONS**

Several clarifications and modifications are required in the HHRA, the SLERA and the refined, Step 3A, ERA methodologies outlined. HERD does not consider these extensive changes.

The modification with the most potential impact to the SLERA is the use of the SFRWQCB Environmental Screening Level of 0.94 µg/L water concentration for



mercury. A minor clarification is the inclusion of a table presenting the range of Bioaccumulation Factors (BAFs) available indicating the value selected as representative. The second minor clarification is validation that more recent scientific studies have not superceded the 'Gold Book' substituted benzene and PAH toxicity values published in 1986.

## **REFERENCES**

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